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REMARKS

Claims 30-40 have been cancelled without prejudice. Claims 21-26 have been amended to correct clerical errors. Claims 21 and 23 have also been amended to more clearly describe the subject matter of the invention. No new matter has been added. Claims 1-29 are pending.

Claims 1, 13, 21, 23 and 28 are independent.

Restriction Requirement

Applicants confirm election of Group I (claims 1-29) without traverse.

Claims Objections

Claims 21-27

Claims 21-27 have been objected to because they include reference characters that are not enclosed within parentheses. See Office Action at page 3. Claims 21-26 have been amended to address this objection. Claim 27 has not been amended because it did not contain any reference characters except by dependency. Applicant respectfully requests reconsideration and withdrawal of this objection.

Claim Rejections

Rejections under 35 U.S.C. § 112, second paragraph

Claims 21-27

Claims 21-27 have been rejected under 35 U.S.C § 112, second paragraph, for being indefinite for failure to distinctly claim and particularly point out the subject matter that applicant regards as the invention. See Office Action at page 3. Claims 21 and 23 are independent. In particular claims 21 and 23 were rejected for failure to provide a proper antecedent basis for the term "respective". Claims 21 and 23 have been amended to address this issue and now comply with 35 U.S.C. § 112, second paragraph, as are the claims that depend from them.

The Examiner also mentions that claims 21-27 are unclear because they rely on a reference character D. Applicants disagree. Dimension D is defined by the claim language. It is the dimension of the inner member normal to the inlet to outlet flow path at any point along the flow path. Because this dimension varies along the flowpath within the inner member, D will

have a different value at each point with a maximum and a minimum; this variance, however, does not render the claim unclear.

Applicant respectfully requests reconsideration and withdrawal of this rejection.

Rejections under 35 U.S.C. § 103 (a)

Claims 1-29 have been rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 4,776,617 to Sato ("Sato '617"). See Office Action at page 4. Claims 1, 13, 21, 23 and 28 are independent.

Claim 1 and Dependents

Applicants have discovered a flexible joint assembly for conducting liquid with an inlet and an outlet and a flow path between the inlet and the outlet that includes a first and second pivot joint and a central fluid conductor coupling the two pivot joints **where the pivot joints provide a greater than 60° bend between the inlet and the outlet**. See independent claim 1. The Examiner asserts that though Sato '617 does not explicitly disclose that the pivot joints together provide a greater than 60° bend that a greater than 60° bend is within the scope of Sato '617's disclosure. Applicants respectfully disagree. Figures 8 and 9 and the discussion pertaining to these figures do not reveal how far the pivots can bend. They do not teach or suggest a bend of greater than 60°. In fact Sato '617 teaches much less than a 60° bend. A reproduction of Figures 8 and Figure 9 have been provided here for the sake of clarity.

Figure 8 Prior Art Cutout

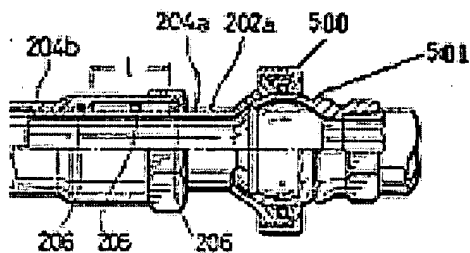
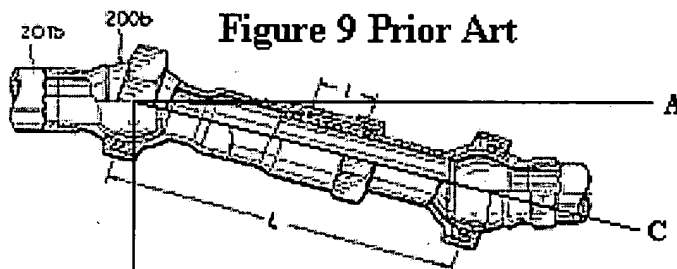


Figure 9 Prior Art



Taking Figure 9¹, which indicates what appears to be a maximum amount of pivot for the structure, the offset angle is a little over 15°(∠AC). Together, then, the maximum bend between the inlet and the outlet is about 30°. The structure of the ball joints in this reference cannot allow for a greater than 60° bend, because of the structure of the Sato '617 device. In Figure 8 above,

¹ Both Figure 8 and 9 of Sato '617 have been modified slightly, for emphasis only. Please see Sato '617 for the original Figures.

the connecting nut labeled 500 at each joint provides a pivot stop in conjunction with a ridge on the structure surface labeled 501. This built in-stop prevents each joint from pivoting beyond the maximum 15° previously mentioned. As a result, Sato '617 does not teach or suggest a pivot joint with a greater angle of bend. This result makes sense based on the purpose of the device in Sato '617. Sato '617 is intended to be a telescoping pipe connection to assist pipes in dealing with compressive forces. See column 1 line 42 to column 2 line 13 of Sato '617. . As such the device is designed to telescope and pivot together, but the range of pivot designed into the device is necessarily small because greater pivot is not needed and would defeat the telescoping nature of the device by directing the force too far in an upward or downward direction to allow the telescoping action to work as Sato '617 desires. If the joints in Sato '617 were allowed to pivot to a greater angle, the telescoping action of the device would not absorb the compressive force because the force would not be directed to the telescoping region. Thus, Sato '617 provides no teaching, suggestion or motivation for a greater than 60 ° bend.

For at least these reasons claim 1 and the claims that depend from claim 1 are patentable over Sato '617. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 13 and dependents

With respect to independent claim 13, Applicants have discovered a flexible joint assembly with an inlet and an outlet and a flow path between the inlet and the outlet that includes a first and second pivot joint and a central fluid conductor coupling the two pivot joints. Each pivot joint has an inner member, a receiving member dimensioned to pivotally receive at least part of the inner member, **a sealing member sealing between the inner member and the receiving member**, and a supporting member that supports the sealing member substantially over the entire length of the seal between the inner member and the receiving member.

Examiner asserts that Sato '617 discloses (in Figures 8 and 9, apparently) all of the elements of claim 13. See Office Action at page 7. In order to match up elements, the Examiner identifies two elements that do not appear in and are not identified anywhere in the disclosure by Sato '617. Examiner asserts that Examiner-created number 300 is a sealing member similar to that included in claim 13 and Applicants' invention. Applicants' respectfully disagree. Sato '617 provides no description of the purpose of item 300. If anything, **item 300 is not a sealing**

member since item 300 is not exposed to the fluid flow path, making a seal at that point needless. In fact, Sato '617, itself, discloses a more likely scenario for what is identified as item 300 by the Examiner. Figure 1 of Sato '617 indicates a similar item as item 300. That item is identified in the specification as 14a annular packing. This item more accurately reflects what Sato '617 discloses with Examiner-created item 300. Annular packing 14a implies that item 300 is just void space fill and not a sealing member at all. Absent identification by the specification that the element is a sealing member, Examiner's creation of it out of whole cloth is, at best, impermissible hindsight. Sato '617 simply does not suggest or teach a sealing member at item 300 because there is nothing to seal at item 300. Thus, the teachings of Sato '617 would not motivate one skilled in the art to put a sealing member in the position of item 300.

For at least these reasons claim 13 and the claims that depend from it are patentable over Sato '617. Applicants respectfully request reconsideration and withdrawal of this rejection.

Claim 21 and Dependents

With respect to independent claim 21, Applicants have discovered a flexible joint assembly with an inlet and an outlet and a fluid flow path between the inlet and the outlet. The fluid flow path is configured with a first pivot joint to pivot around a first pivot and a second pivot joint configured to pivot around a second pivot with a central fluid conductor connecting the first and second pivot joints. Each pivot joint includes an inner member with a dimension D in a direction that is substantially normal to the joint assembly inlet and outlet, a receiving member that is dimensioned to receive at least part of the inner member, and **a sealing member that seals the inner member to the receiving member** at a distance of less than 14% of the maximum dimension D from the pivot.

The Examiner asserts that Sato discloses each and every element of claim 21. See Office Action at page 8. Applicant respectfully disagrees. As discussed previously, Sato does not disclose, teach, suggest, or motivate one skilled in the art to include a sealing member of any type. Sato does disclose annular packing, not a sealing member. In addition, Sato does not disclose a sealing member that seals the inner member to the receiving member at a distance of less than 14% of the maximum dimension D from the pivot. Sato does not suggest, teach, or motivate one skilled in the art to include a sealing member in the pivot joint, let alone a sealing member that is sized to be less than 14% of the maximum dimension D of the inner member.

For at least these reasons independent claim 21 and the claims that depend from it are patentable. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 23 and Dependents

With respect to independent claim 23, Applicant has described a flexible joint assembly with an inlet and an outlet connected by a fluid flow path. The flow path also includes a first pivot joint configured to pivot over a first arc about a first pivot, and a second pivot joint configured to pivot over a second arc about a second pivot. The pivot joints are fluidly coupled by a central fluid conductor. Each pivot joint includes a received joint member with a dimension D in a direction substantially normal to the inlet-outlet flow path, and a receiving joint member dimensioned to pivotally receive at least part of the received joint member. Each received member is either coupled to the joint assembly inlet or outlet or coupled to the central fluid conductor and each receiving member is coupled to either the central fluid conductor or the joint assembly inlet or outlet. In addition, the joint assembly includes a contact point between each receiving joint member and the central fluid conductor whereby the pivot joint is fully pivoted over the respective arc within 75% of the maximum dimension D distant from the respective pivot.

The Examiner asserts that Sato '617 discloses each and every element contained in claim 23. See Office Action at page 9. Applicant respectfully disagrees. Sato '617 does not disclose a joint assembly that includes a contact point between each receiving joint member and the central fluid conductor whereby the pivot joint is fully pivoted over the respective arc within 75% of the maximum dimension D distant from the respective pivot. Sato '617 does not discuss nor disclose the pivotability of its device and does not define a device that can pivot in a manner approaching that related in claim 23. The device of Sato '617's as indicated in the disclosure and the drawings is inherently not capable of the range of pivotability of Applicant's device as indicated in claim 23. Sato '617 does not teach, suggest, or motivate one skilled in the art to design a device with increased pivotability. The device of Sato '617 is used to relieve compressive forces between two runs of piping. As such the device is designed to telescope and pivot together, but the range of pivot designed into the device is necessarily small because greater pivot is not needed and would defeat the telescoping nature of the device by directing the force too far in an upward or downward direction to allow the telescoping action to work as Sato '617

desires. Given this feature, Sato '617 would not motivate one skilled in the art to design a device whereby a pivot joint is pivoted over the respective arc within 75% of a maximum dimension D distant from the respective pivot. Sato '617 simply does not suggest or teach such a device, because Sato '617 would not function with the properties of Applicant's device.

For at least these reasons claim 23 and the claims that depend from it are patentable over Sato '617. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Claim 28 and Dependents

With respect to claim 28, Applicant has discovered a flexible joint assembly that includes a first ball and socket joint, a second ball and socket joint and a unitary central fluid connector connecting the first ball and socket joint and the second ball and socket joint, where the assembly is configured to withstand pressures between 200 and 5000 psi. See independent claim 28.

Sato '617 teaches a telescopic swivel pipe joint that is composed of three pieces, two main joints with cylindrical tubes directed toward each other (see 16a and 16b of Figure 1 of Sato) and an auxiliary joint tube that connects the two main joint tubes and allows them to telescope (See 5 of Figure 1 of Sato). The flexible joint assembly of claim 28 has a **unitary central fluid connector**. The assembly of Sato '617 does not have a unitary central fluid connector and would not function with one. Instead the three pieces mentioned above make up the fluid connector in Sato '617. This non-unitary assembly is necessary to enable the Sato '617 design to telescope when exposed to a compressive force. See column 3 line 46- column 4 of Sato '617. For this reason Sato '617 does not teach, suggest or motivate one skilled in the art to use a unitary central fluid connector. Indeed, such a fluid connector would render the design of Sato '617 and its function inoperable.

For at least this reason independent claim 28 and the claims that depend from it are patentable over Sato '617. Applicant respectfully requests reconsideration and withdrawal of this rejection.

Attached is a marked-up version of the changes being made by the current amendment.

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CONCLUSION

Applicant asks that all claims be allowed. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 12-12-02



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Version with markings to show changes made

In the claims:

Claims 30-40 have been cancelled.

Claims 21-26 have been amended as follows:

--21. (Amended) A flexible joint assembly comprising:

a joint assembly inlet;

a joint assembly outlet; and

a fluid flow path between the inlet and the outlet, the fluid flow path including:

a first pivot joint configured to pivot about a first pivot (P1);

a second pivot joint configured to pivot about a second pivot (P2);

and

a central fluid conductor fluidly coupling the first pivot joint and the second pivot joint, each of the first pivot joint and the second pivot joint including:

an inner member having a dimension (D) in a direction substantially normal to a path through **[the respective of the joint assembly]**each of the pivot joint assemblies' inlet and outlet;

a receiving member dimensioned to receive at least part of the inner member; and

a sealing member sealing the inner member to the receiving member at a distance of less than 14% of the maximum dimension (D) from the respective pivot.

22. (Amended) The flexible joint assembly of claim 21 wherein:

the first pivot (P1) is a pivot point;

the second pivot (P2) is a pivot point.--

--23. (Amended) A flexible joint assembly comprising:

a joint assembly inlet;

a joint assembly outlet; and

a fluid flow path between the inlet and the outlet, the fluid flow path including:

a first pivot joint configured to pivot over a first arc about a first pivot (P1);

a second pivot joint configured to pivot over a second arc about a second pivot (P2); and

a central fluid conductor fluidly coupling the pivot joints, each of the first pivot joint and second pivot joint including:

a received joint member having a dimension (D) in a direction substantially normal to a path through **[the respective of the joint assembly]**each of the pivot joint assemblies' inlet and outlet; and

a receiving joint member dimensioned to pivotally receive at least part of the received joint member, wherein:
either the received joint member is coupled to one of the joint assembly inlet and the joint assembly outlet and the receiving joint member is coupled to the central fluid conductor, or the receiving joint member is coupled to one of the joint assembly inlet and the joint assembly outlet and the received joint member is coupled to the central fluid conductor; and

a contact point between each receiving joint member and the central fluid conductor whereby the pivot joint is fully pivoted over the respective arc being within 75% of the maximum dimension (D) distant from the respective pivot.--

--24. (Amended) The flexible joint assembly of claim 23 wherein each receiving joint member extends less than 35% of the maximum dimension (D) beyond the respective pivot.--

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--25. (Amended) The flexible joint assembly of claim 24 wherein each receiving joint member extends less than 30% of the maximum dimension (D) centrally beyond the respective pivot.--

--26. (Amended) The flexible joint assembly of claim 23 wherein each of the first pivot (P1) and the second pivot (P2) is a pivot point.--